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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,806	12/24/2003	Toshiaki Yoshihara	032148	1723

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EXAMINER	
DINH, DUC Q	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/743,806	YOSHIHARA ET AL.	
	Examiner	Art Unit	
	DUC Q. DINH	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-15* is/are pending in the application.

4a) Of the above claim(s) *13 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-12 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/02/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3-8, 10-12 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Lim et al. (U.S Patent No. 7,053,880), hereinafter Lim.

In reference to claim 1, Lim discloses a field-sequential type display device for performing a display by synchronizing successive switching of lights of a plurality of colors to be incident on a display element with light control in said display element based on display data of each color corresponding to an image to be displayed (col. 1, lines 12-21) , comprising:

a detecting unit (120 of Fig. 7 and ST 1 of Fig. 9) for detecting a maximum grayscale level of the display data for each color (the maximum grayscale level of each color is detected to obtain the average value Ra, Ga and Ba see col. 8, lines 47-55); and the grey scale level of the maximum brightness being variable for each of the subframes of the colors through out performing the display, (the maximum of brightness for each of the red (Ra) and green (Ga) and blue (Ba) having different intensity levels, i.e. being variable, according to the input image data (each input image has different

gray scale levels for the R,G,B color, the grayscale level of maximum brightness of the input display data of each color is variable for each image throughout displaying; and the detecting unit detecting the max level for each gray scale level for each data color to calculate the average level for each subframe; furthermore Lim discloses when a luminance of the component is read high from the image signal, the luminance of the component R may be increased by turning the light source red at the fourth subframe, SF4 is also variable. If one color of Cyan, magenta and Yellow, which are complementary of color R, G and B is particular stressed among the image signal, the luminance of the stressed color may be increased by turning on two light sources among the light sources Red, Green and Blue the fourth subframe)

an adjusting unit (120 of Fig. 7 and ST 2 of Fig. 9) for adjusting, individually independently for each color, an intensity of light incident on said display element and a light control variable in said display element, based on the respective grayscale level of each color detected in a detection result for each of said detecting unit (col. 8, line 55 – col. 6, lines 6).

In reference to claim 3, Lim discloses wherein said detecting unit detects a grayscale level of maximum brightness of the display data in a predetermined period, and, when obtaining the maximum brightness, said adjusting unit adjusts the light control variable in said display element so as to have maximum transmittance or reflectance of incident light on said display element and adjusts the intensity of incident light according to the adjusted light control variable (see col. 8, lines 49-65).

In reference to claim 4, Lim discloses that when obtaining brightness of a grayscale level other than the grayscale level of maximum brightness, said adjusting unit adjusts the light control variable in said display element.

In reference to claim 5, Lim discloses wherein an intensity of light incident on said display element after adjusting the intensity of light and the light control variable by said adjusting unit is smaller than an intensity of light incident on said display element without performing the adjustments (col. 8, line 65- col. 9, line 1).

In reference to claim 6, Lim discloses wherein an incident region of light to be incident on said display element is divided, and the detection of a grayscale level by said detecting unit and the adjustments of the intensity of light and the light control variable by said adjusting unit are performed for each of the incident regions (see Fig. 10, col. 41-61).

In reference to claims 7 and 8, Lim discloses wherein said display element is a liquid crystal display element and wherein a liquid crystal material used in said liquid crystal display element has spontaneous polarization (see Fig. 1 col. 2, line1-14 and col. 7, line 60 - col. 8, line 5).

In reference to claim 10, Lim discloses wherein the lights of a plurality of colors to be incident on said display element are red light, green light, and blue light (see Fig. 9 at ST2).

In reference to claim 11, Lim discloses wherein the lights of a plurality of colors to be incident on said display element are red light, green light, blue light, and white light (see col. 8, lines 57-60).

In reference to claim 12, Lim discloses a converting unit for converting red, green and blue display data into red, green, blue and white display data, wherein said detecting unit detects grayscale levels of display data obtained by said converting unit (input values of each sub-frame are converted by the image signal processor. That is, when the average luminance of Ra, Ga, Ba greater than the grey level 128, the light source corresponding to the component having a larger average luminance with be turned on at the fourth sub-frame; see col. 8, lines 49-65).

In reference to claim 14, Lim display method for performing a field-sequential type display by synchronizing successive switching of lights of a plurality of colors to be incident on a display element with light control in said display element based on display data of each color corresponding to an image to be displayed (see rejection of Claim 1), comprising:

detecting a grayscale level of the display data for each color (see steps ST1 and ST2 of Fig. 9); and (the maximum of brightness for each of the red (Ra) and green (Ga) and blue (Ba) having different intensity levels, i.e. being variable, according to the input image data (each input image has different gray scale levels for the R,G,B color, the grayscale level of maximum brightness of the display data of each color is variable for each input image throughout performing the display; and the detecting unit detecting the max level for each gray scale level for each data color to calculate the average level for each subframe; furthermore Lim discloses when a luminance of the component is read high from the image signal, the luminance of the component R may be increased by turning the light source red at the fourth subframe, SF4 is also variable. If one color of

Cyan, magenta and Yellow, which are complementary of color R, G and B is particular stressed among the image signal, the luminance of the stressed color may be increased by turning on two light sources among the light sources Red, Green and Blue the fourth subframe)

adjusting, individually independently for each color, an intensity of light incident on said display element and a light control variable in said display element, based on the respective a detection result of the grayscale level of each color respectively (see Steps ST2 and ST3 in Fig. 9 and col. 8, line 43- col. 10, line 40).

3. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim in view of Sato et al. (U.S Patent No. 7,030,848), hereinafter Sato.

In reference to claim 8, Lim does not disclose a liquid crystal material used in said liquid crystal display element has spontaneous polarization. Sato discloses a liquid crystal display using liquid crystal display material used in the liquid crystal display element having spontaneous polarization (col. 42, lines 45-49).

It would have been obvious for one of ordinary skill in the art at the time of the invention use the liquid crystal material display element having spontaneous polarization in the device of Lim as taught by Sato because it would ensure sufficient light emitting time and achieve more satisfactory display (col. 42, lines 52-55).

In reference to claim 9, Lim discloses the display device can be a reflecting type of Digital light Processing devices (col. 11, lines 25-36) but does not disclose the display element is a digital micro mirror device. Sato discloses liquid crystal display receiving

video signal and controlling the intensity of the backlight and a display element based on the receiving display data (see Fig. 4, col. 12, lines 36-54) and the driver circuit can further used for reflective liquid crystal display such as DMD (Digital Mirror Device).

It would have been obvious for one of ordinary skill in the art at the time of the invention to substitute the reflective display device of Lim with the display element is a Digital Mirror Device as taught by Sato as suggested by Yoshinaga (the invention is not limited to liquid crystal element and may be a light receiving type and projection type such as Digital Mirror Device) to provide a reflective liquid crystal display such as DMD to provide good image brightness and contrast, and therefore produces more reliable gray scale patterns for the display system.

Response to Arguments

4. Applicant's arguments with respect to the elected claims 1, 3-12 and 14 have been considered but not persuasive. Applicant argues that "Lim does not teach or suggest "the gray scale level of maximum brightness being variable for each of subframes of the colors throughout performing display". However, as discussed above, the maximum brightness of each input image signal is detected to perform the display of the R, G, B; and the inut display data of each frame is variable according to the input image signal, each image data input has different maximum brightness level to be displayed throughout displaying , i.e. each of the subframes has different maximum brightness grayscale levels. Fig. 8 shows the gray scale levels for the fourth subframe and it can be variable according to the level of one of the R, G and B as discussed in claim 1 above. Furthermore, as in abstract, Lim discloses "... deciding a maximum

luminance value of the field sequential display using the gray level, obtaining the average luminance of each of the R, G, and B from the input signal, each input signal has variable grey scale of the maximum brightness, turning on one of the light sources having an average luminance greater than the maximum luminance at the fourth subframe and converting the input luminance value of the component R, G and B and an input luminance of the fourth subframe using image signal processor.

The rejection, therefore, is maintained.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUC Q. DINH whose telephone number is (571)272-7686. The examiner can normally be reached on Mon-Fri from 8:00.AM-4:00.PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, AMR A. AWAD can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duc Q Dinh/

Examiner, Art Unit 2629